

AD-A191 769

A STATISTICAL DESCRIPTION OF SHIPBOARD ENVIRONMENT AND
EMITTER SIGNALS WITHIN A 250 MHZ BAND AT 1 GHZ(U) NAVAL
OCEAN SYSTEMS CENTER SAN DIEGO CA W R CROWNN DEC 87

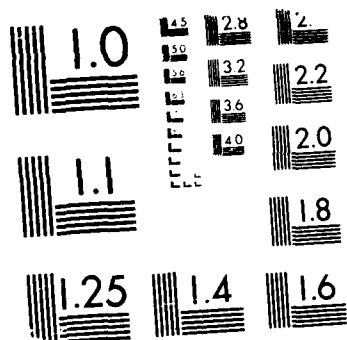
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UNCLASSIFIED

F/G 28/14

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MICROCOPY RESOLUTION TEST CHART
 U.S. GOVERNMENT PRINTING OFFICE: 1963 O - 348-094

AD-A191 769 PORT DOCUMENTATION PAGE

UNCLASSIFIED			1b. RESTRICTIVE MARKINGS		
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION/AVAILABILITY OF REPORT		
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE			Approved for public release; distribution is unlimited.		
4. PERFORMING ORGANIZATION REPORT NUMBER(S)			5. MONITORING ORGANIZATION REPORT NUMBER(S)		
6a. NAME OF PERFORMING ORGANIZATION	6b. OFFICE SYMBOL (if applicable)	7a. NAME OF MONITORING ORGANIZATION			
Naval Ocean Systems Center	NOSC	Naval Ocean Systems Center			
6c. ADDRESS (City, State and ZIP Code)		7b. ADDRESS (City, State and ZIP Code)			
San Diego, California 92152-5000		San Diego, California 92152-5000			
8a. NAME OF FUNDING/SPONSORING ORGANIZATION	8b. OFFICE SYMBOL (if applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER			
Space and Naval Warfare Systems Command	SPWR				
8c. ADDRESS (City, State and ZIP Code)		10. SOURCE OF FUNDING NUMBERS			
JTIDS Program Office Washington, DC 20999		PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	AGENCY ACCESSION NO.
		25604N	CC54		DN213 105
11. TITLE (include Security Classification)					
A Statistical Description of Shipboard Environment and Emitter Signals Within a 250 MHz band at 1 GHz					
12. PERSONAL AUTHOR(S)					
W.H. Cronyn					
13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)		15. PAGE COUNT	
Professional paper/speech	FROM Jun 1987 TO Jun 1987	December 1987			
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	electromagnetic environment		
			circular array		
			vertical dipoles		
19. ABSTRACT (Continue on reverse if necessary and identify by block number)					
<p>Measurements are being taken to achieve and ensure Electromagnetic Compatibility between the shipboard Joint Tactical Information Distribution System, scheduled for introduction into the U.S. Navy in the 1990's, and existing shipboard radar, beacon and identification systems. The description of the electromagnetic environment in time and frequency is complicated by the inherent structure of the emitted signals because they are pulsed, some at irregular pulse periods, and radiated from rotating antennas. The signal level distribution is further complicated by reflections off other rotating antennas. The complex time/frequency structure of the signals and the statistical nature of the JTIDS system suggested that the signal level measurements should be statistical. The shipboard system used for the measurements presented in this paper is configured around a Hewlett-Packard 8566B spectrum analyzer/85685A preselector operating at a 3 MHz bandwidth, which is comparable to the RF bandwidth of the JTIDS signal. The transducer is a circular array of eight vertical dipoles which can be wrapped around a ship's mast. The instruments are HP-IB controlled with an HP9816 computer which also does real-time processing and transfers data to an HP9133H hard/floppy disc drive. A logging record is maintained on an HP ThinkJet printer with both alphanumeric and graphical data displayed. Statistical measurements with a dynamic range in excess of 160 dB can be made through hard-wired connections to individual emitters with a notch filter centered at the emitter frequency. Both the hard-wired individual emitter and shipboard electromagnetic environment results are presented as cumulative distribution functions of the measured signal levels for each of the 86 3 MHz channels between 960 and 1215 MHz. EMC problems are clearly and quantitatively identified. This statistical approach to the measurement of EMI is applicable to other EM environments if the emitters of the victims operate in a statistical fashion.</p> <p>Presented at International Conference and Workshop on Electromagnetic Interference and Compatibility (INCEMIC), Bangalore, India, 10-11 Sep 1987.</p>					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT			21. ABSTRACT SECURITY CLASSIFICATION		
<input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS			UNCLASSIFIED		
22a. NAME OF RESPONSIBLE INDIVIDUAL			22b. TELEPHONE (include Area Code)		22c. OFFICE SYMBOL
W.H. Cronyn			619-553-5084		Code 825

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MAR 11 1989
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Statistical Description of Shipboard Environment and
Signals Within a 250 MHz Band at 1 GHz"

Abstract for:

International Conference and Workshop on
Electromagnetic Interference and Compatibility
Bangalore, India 10-11 September 1987

Submitted by: Dr. W. Cronyn

04 February 1987

Electromagnetic Compatibility Engineering, Code 825

Naval Ocean Systems Center
San Diego, CA 92152-5000

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